

# SEEDS OF DIVERSITY



Iowa DNR Prairie Seed Harvest Team

March 2005

## WELCOME

**WELCOME** to the IDNR Prairie Seed Harvest Team's first newsletter. If all goes according to plan, this will be a quarterly newsletter that will provide useful information and answer your questions about prairie and prairie management. We may even ask you questions! But the newsletter won't be filled with just facts and figures, we'll also have some pretty pictures. So, if you like what you read, have a constructive criticism, or have a future topic you would like us to address, please let us know.

Your Prairie Seed Harvest Team

## PRAIRIE SEED + WILDLIFE GRANT = NEW COORDINATOR + QUALITY HABITAT

Many elements are necessary for the successful restoration and reconstruction of Iowa's prairies. These include properly identifying sites, coordinating the seeding process, and coordination of maintenance including prescribed burns. Through a State Wildlife Grant, matched with prairie seed grown by the Iowa DNR Prairie Seed Team, the Wildlife Bureau now has a coordinator in the Prairie Pothole Joint Venture (PPJV) region to direct these activities. Ron Howing is the new coordinator. (We welcome Ron Howing in his new role as coordinator.)

The objective of this project is to plan and implement restoration, enhancement, and reconstruction of mixed native prairie grasslands. This will be accomplished as follows:

- Annually identify at least 600 acres of grasslands on public wildlife areas that have the potential to improve the survival and reproduction of species of conservation concern.
- Annually reconstruct at least 200 acres of new mixed native prairie through seeding.
- Annually plan/oversee at least 300 acres of prescribed burns for native prairie enhancement and mixed prairie reconstruction.
- Annually plan/oversee the clearing/removing of woody successional species affecting at least 100 acres of native prairie.

This project will permit the IDNR to accelerate improvement and diversification of restored, reconstructed, and degraded native prairies on public lands. Considerations for increased



planning, contracting, and related project oversight will allow the IDNR to increase the current annual rate of prairie restoration/reconstruction by at least 25%. Focus of these efforts will be selected Bird Conservation Areas (BCA's), PPJV wetland-grassland complexes, and other large public lands in northwestern Iowa's prairie pothole region.

Selected large complexes of public land will be designated for future research on declining wildlife species, their habitat requirements, reproductive success and similar topics. For instance, comparing bird use of different seeding types such as smooth brome, native grasses, and diverse native grass and forbs is in the planning stages. Outcomes can be applied to future grassland management of IDNR managed land.



Kalsow Prairie, July 20, 2004

This exciting new program will allow the IDNR to improve the quality of existing and future stands of native prairie managed by the Wildlife Bureau. This improvement in diversity and quality will positively affect the many wildlife species that utilize Wildlife Management Area's, Waterfowl Production Area's, and BCA's

## Pure Live Seed Variables

When discussing prairie plantings I am often asked questions such as:

What is TZ?

How is purity determined?

Stratification and scarification; I confuse the terms. What are the differences?

When should I plant the seed?

How much seed should I plant?

What is TZ?

TZ stands for tetrazolium which is the stain used to define the caryopsis (the living breathing portion) of a seed. If the caryopsis is complete, there is live seed. By staining and testing a sample of seed, the percentage of viable seed can be determined. The advantage of doing a TZ test is to show possible caryopsis weakness. This weakness can be a sign of low seedling vigor. Seeds with caryopsis weakness may germinate but will often die during the seedling stage of the plant.

Purity is the second portion of the seed test. When a seed sample is sent to the lab, a combination of airflow and screens is utilized to separate seed from inert matter. Included in the pure seed component of the test is all seed; seed that is immature, insect damaged, partially germinated, infected with fungus, and normal. Inert matter consists of leaves, broken seeds, seeds one-half the original size, glumes, empty florets, dust and debris.

A sample of the seed lot is selected and separated in this way. If the seed portion weighs 5 ounces and the inert portion weighs 5 ounces, then the purity is 50%.

One problem with the purity evaluation is the seed cleaning treatment. A bearded big bluestem seed weighs more than a de-bearded seed. A purple prairie clover seed still in its hull weighs more than one not in its hull. We old timers can still remember when native grass seeding recommendations called for 10-12 Pure Live Seed (PLS) pounds per acre. One of the reasons for that recommendation is most of the native grass seed still had beards on, so it weighed more,



and therefore had to be planted at a higher rate. Today, because seed has been de-bearded, most recommendations call for 5-8 PLS pounds of native grass seed per acre.

Is seed from IDNR Prairie Seed Team de-bearded and hulled? Yes; if it has gone through our cleaning process, the grass seed has been de-bearded and legumes have been hulled. The exception to this would be seed that has come directly from the combine. If you have received seed in the large soybean bulk bags, it has not been through the cleaning process and should be planted at a slightly higher rate.

Many native forb seeds have seed dormancy. This means seed will not germinate without meeting certain preset conditions. For example, legumes will not germinate unless the seed coat is scarified/scratched. Most other forb seed has to be put through cold, wet conditions to simulate winter. This is called stratification. Even with live seed, if conditions needed to break dormancy are not met, the seed will not germinate.

How does one best manage for all variables? For best germination rates, forbs should be planted in late fall or early spring. This timing allows weather conditions to naturally stratify most forb seed thereby breaking its natural dormancy. Legume scarification is most often done in the cleaning process when seed is hulled. Two processes that naturally scarify legume seed are fire and ingestion by an animal, with fire being most common. Planting grasses during the dormant period can have both positive and negative effects on germination. A number of grasses have some dormancy and with stratification, their germination rate can be increased. But this can have a negative effect with the onset of fungal diseases during the cold, wet spring. The bottom line on grass is, it may have to be planted at a slightly higher rate (+10%) if planted in the dormant season.

How much seed should I use to plant 30 acres? Step 1. The first information you need to determine is the amount of PLS that you will be planting per acre. I would recommend about 8 PLS per acre. Therefore, the total amount of PLS needed for the project is 30 acres x 8 PLS pounds/acre = 240 PLS pounds. Step 2. Determine the PLS in the seed that you received from the Prairie Seed Team. Your seed has a purity of 85% and a TZ of 80% then the PLS factor is determined by multiplying  $.85(\text{purity}) \times .8(\text{TZ}) = .68(\text{PLS factor})$ . For 100 pounds of bulk seed, there are 68 pounds of pure live seed. Step 3. How much bulk seed do you need? You need (step 1) 240 PLS pounds total to seed the project, so divide total PLS needed (240PLS) by .68 PLS factor (step2) = 352.9 bulk pounds to seed the 30 acres. Step 4. Bulk rate per acre is determined by dividing bulk pounds (352.9) by 30 acres = 11.76 bulk pounds per acre.

## FEATURE SPECIES;



Pasque Flower, *Pusatilla patens*, is a member of the *Ranunculaceae* family. It is the first prairie forb (flower) to emerge in the spring and is sometimes called the Easter crocus. In central Iowa, it is often blooming at the end of March. It grows on dry, sandy or gravelly knolls. It is fairly common in NW Iowa, infrequent in the low-lying surface, and rare in the Paleozoic Plateau of NE Iowa.

The Prairie Seed Team collected pasque flower seed from a private prairie remnant in Hamilton County in Spring 2004. Germination has been very low.

## FUTURE TOPICS

Seeding rates  
Species list  
Prairie work days-  
planting plugs  
Seed order form  
Seedling identification  
  
Send us your topics of  
interest  
Send us your favorite  
prairie photo  
Send us your questions

Photos in this issue were taken by  
MJ Hatfield, AmeriCorps Volunteer



**Wings; Essays on Invertebrate Conservation; The Xerces Society; fall 2004**

Invertebrates are the most kaleidoscopic, multi-morphic, and panchromatic – in a word, spectacular – manifestation of life on Earth. They fill the seas, the skies, and the soils. In every kind of habitat (Yes, prairie!), they play key roles in the ecosystem processes that keep our biosphere's organic machinery humming. Crucial to our everyday lives, invertebrates provide us with textiles and medicines, as well as every fourth bite of food that we eat.

But how well are invertebrates faring at the beginning of the twenty-first century, against the all-too-familiar onslaught of habitat loss, introduced species, over harvesting, and pollution? How can we best conserve and manage the vast array of invertebrate biodiversity – probably constituting 99% of all animal species on Earth – when several million species (estimated at 5-8 million) remain undescribed? Do the dominant paradigms of biodiversity conservation practice truly serve the interests of our spineless neighbors, and if not, how can we better integrate them into mainstream efforts to save and preserve this planet's natural world? Sacha Spector



Estigmene acrea on Black eyed Susans, July 2004

Moth species in Iowa are conservatively “estimated” at 1500 species. However, no one knows for sure because there are too few Iowa moth collections and far too few people studying moths.

The best moth book, to date, is the Roger Tory Peterson Field Guide, Moths, by Dr. Charles V. Covell, Jr. This book is out of print but is currently selling at used book stores, when you can find it, for \$150. For a few years now there have been reliable rumors that Dr. Covell is in the process of updating the book for future publication.

**Estigmene acrea, Saltmarsh caterpillar**

The larva/caterpillar *Estigmene acrea* has a misnomer common name of Saltmarsh caterpillar or *Acrea* moth. These larvae are active dispersers eating as they go. The photo (to the left) was taken at our Adel prairie forb production plot. Another caterpillar of the same species was allowed to pupate within an enclosed terrarium and emerged as an adult (photo below) in February 2005. It is common throughout the U.S. and is considered a pest\* on many plant species.



\*We use the word “pest” with the full knowledge that what may be a pest to a specific plant species, or to us humans, may not be considered a pest to a robin or a quail.

“Those unconcerned about the natural world, and I hope their numbers are dwindling by persuasion, will do well to consider the consequences for humanity of the decline of pollinator complexes. Eighty percent of the species of our food plants worldwide, we are informed, depend on pollination by animals, almost all of which are insects. One of every three mouthfuls of food we eat, and of the beverages we drink, are delivered to us roundabout by a volant bestiary of pollinators.”

E.O.Wilson in the Forward of The Forgotten Pollinators

By Stephen L. Buchmann and Gary Paul Nablan, 1996, p.xiv